



ITCE 315: Computer Networking

Midterm Exam II
Date: Sun 08.12.2013
Duration: 60 minutes

SID:

Name:

Section:

DRAAGON

Question	Mark	Mark Attained
1	5	4.5
2	4	4
3	11	10
Total	20	18.5

Q1. Choose the most correct answer from the following [5 Marks, 1/2 Mark each]:

1. Suppose a client sends an HTTP request message with the If-modified-since: header. Suppose the object in a server has not changed since the last time a client retrieved the object. Then the server will send a response message with the status code:

- ☒ a) 304 Not Modified
- b) 200 OK
- c) 404 Not Found
- d) none of the above

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2. Suppose a DNS resource record has Type=MX. Then:

- a) Value is the IP address of the mail server that has the alias hostname Name.
- b) Value is the hostname of the DNS server that is authoritative for Name.
- ☒ c) Value is the hostname of the mail server that has the alias hostname Name.
- d) none of the above

3. The transfer of an html file from one host to another is:

- a) loss-intolerant and time sensitive
- b) loss-tolerant and time sensitive
- ☒ c) loss-intolerant and time insensitive
- d) none of the above

4. Local DNS name servers:

- ☒ a) cache resource records, but discard them after a period of time that is on the order of a few days
- b) obtain resource records from Web caches
- c) never cache resource records
- d) cache resource records and never discard them

5. During an FTP session the data connection is opened _____.

- a) exactly once
- b) exactly twice
- ☒ c) as many times as necessary
- d) none of the above

6. In FTP, when we _____, it is copied from the server to the client.

- ☒ a) retrieve a file
- b) retrieve a list
- ☒ c) a and b
- d) none of the above

7. In FTP, when we _____, it is copied from the client to the server.

- ~~a) retrieve a file~~
- ☒ b) store a file
- c) retrieve a list
- d) none of the above

8. The third stage in an email transfer needs a _____ protocol.

- ☒ a) Pull
- b) Push
- c) both a and b
- d) none of the above

9. In _____ resolution, the resolver expects the server to supply the final answer.

- ~~a) iterative~~
- ☒ b) recursive
- c) straight
- d) none of the above

10. In _____ resolution, the server returns the IP address of the server that it thinks can resolve the query.

- ☒ a) iterative
- b) recursive
- c) straight
- d) none of the above

Q2) Fill in the space in the table below that summarizes the difference between the three application protocols: DNS, SMTP and FTP. [4 Marks]

	HTTP	DNS	SMTP	FTP
Transport Layer Service (Protocol)	TCP	UDP	TCP	TCP
Stateless/State across sessions	stateless	stateless	stateless	statefull
Pull/Push	Pull	Pull	Push	Push & Pull
Persistent/Non-persistent	persistent default	non-persistent	persistent	control connection: persistent data connection: non-persistent

and can be modified to be non-persistent

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Q3) (short answer questions) [11 Marks]

a) Explain how DNS server helps achieve load balancing (load distribution) [1 Marks]

~~every time we make a request to a website that has more than one server, DNS will rotate (shuffle) these servers so every time we make a request, the request will be to different server.~~

b) What is the mail transfer protocol used in the Internet? What are the possible mail access protocols used between the receiver's mail server and the user agent? What are the protocols used between the sender's mail server and the sender? [3 Marks]

- mail transfer protocol used in the internet is ~~SMTP~~.
- possible mail access protocols used between the receiver's mail server and the user agent: ~~POP3, IMAP, HTTP~~.
- protocols used between the sender's mail server and the sender: ~~SMTP~~ and ~~HTTP~~ is using web browser.

c) Describe how Web caching can reduce the delay in receiving a requested object. Will Web caching reduce the delay for all objects requested by a user or for only some of the objects? Why? [2 Marks]

- ~~web caching can reduce the delay by using proxy servers, these servers keep a copy in their storage for the requested object, and can reply these objects in later requests (same requests). proxy servers usually installed locally, and they are fast, so this make the delay minimum.~~
- web caching will ~~not~~ reduce the delay for all objects, because not all objects stored in the cache server.
- * reduce delay for all objects, because it reduce the traffic on the access link.

- d) Suppose you wanted to do a transaction from a remote client to a server as fast as possible. Would you use UDP or TCP? Why? [1 Mark]

I will use UDP, because there is no ~~bandwidth overhead~~ and no connection setup is required.

- e) Consider an e-commerce site (e.g., Amazon.com) that wants to keep a purchase record for each of its customers. Describe how this can be done with cookies? [2 Marks]

When the customer enters the website for the first time, amazon.com will respond with set-cookie: header to the customer with an identifier. The cookie file is stored in the customer machine, and ~~the~~ the ID is stored in backend database in amazon.com. Then, when the customer makes request to the website, the browser will use cookie: header with the same ID, so amazon.com can keep track of the user's purchases.

- f) The DNS uses a large number of servers organized in a hierarchical and distributed around the world. Discuss two disadvantages of the centralized design compared with distributed design (A simple/centralized design for DNS would have one DNS server that contains all the mappings). [2 Mark]

disadvantages of the centralized design:

- maintenance: single server will have to maintain all databases of the IP addresses and host names, which is so difficult.
- single point of failure: if the server is down, the whole internet will be down.